Llŷr 1 Floating Offshore Wind Farm

Outline Marine Mammal Mitigation Plan

November 2025

Document:

P10-LLY-4.2.3-PLA-0003

Rev	Date	Purpose of Issue	Prepared by	Checked By	Approved By
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02	11/11/25	For Consultation	L Williamson	C Gall	M Murray

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1. INTRODUCTION

The primary aim of this draft Marine Mammal Mitigation Plan (MMMP) is to provide an overview of what will be included within the outline MMMP, including the planned measures to reduce the risk of Permanent Threshold Shift (PTS) auditory injury to any marine mammal species from pile driving of mooring anchors or any UXO clearance to negligible levels, along with reduction of entanglement risk.

The MMMP establishes the principles which will be implemented during construction. Following the granting of the Section 36 Consent and Marine Licence for the proposed Project and once the final project design has been confirmed, a final MMMP will be prepared.

The final MMMP will be agreed with the Regulator and Statutory Nature Conservation Bodies (SNCB) as part of the post-consent dialogue and discharge of conditions. The Applicant will ensure that the final MMMP is implemented in practice during wind farm construction[1] and operation; all agreed mitigation measures, monitoring and reporting requirements.

2. MITIGATION METHODOLOGY

In order to minimise the risk of any auditory injury to marine mammals from underwater noise during anchor pile driving, there are standard mitigation measures that the Project could implement for piling. These mitigation measures include the following measures:

- Marine Mammal Observers (MMO);
- Passive Acoustic Monitoring (PAM);
- Acoustic Deterrent Devices (ADD); and
- Piling soft-start procedure.

The following sections provide a high-level methodology for each of these elements. A final MMMP will be produced prior to the relevant works commencing for approval by NRW and JNCC.

In addition to MMO/PAM/ADD, use of noise mitigation (e.g. bubble curtains) or abatement (e.g. alternative hammer technologies) will be considered as part of the final MMMP for piling; however, some methods may not be feasible given physical or operational constraints at the site.

2.1 Mitigation Zone

Discussion will be held with the regulator regarding the size of Mitigation Zone (MZ) deemed appropriate. This discussion will consider the un-weighted peak Sound Pressure Level, the weighted Sound Exposure Level, along with operational feasibility. For the purpose of this draft MMMP, a 500 m (MZ) is assumed, as per the recommendations of the JNCC guidelines on mitigating effects of impact piling. The mitigation zone will be determined through consultation with SNCBs and informed by relevant JNCC guidelines for mitigation of impact to marine mammals from piling, geophysical surveys and explosions, as well as relevant EDRs.

For any UXO detonations, a minimum 1-km mitigation zone would be maintained, as per relevant JNCC guidelines, and the project would aim to use low-order detonation techniques in compliance with the latest government guidance. If UXO clearance is required, it will be undertaken in compliance with the latest DEFRA guidance.

[1] Including any relevant pre-construction surveys,

2.2 Marine Mammal Observers (MMOs)

The pre-piling watch for marine mammals will be conducted for a minimum of 30 minutes prior to the commencement of the soft-start procedure. The MMO will undertake visual monitoring for marine mammals within the MZ around the piling location from a suitable elevated platform. The MMO will record all periods of marine mammal observations, including start and end times. Details of environmental conditions (sea state, weather, visibility, etc.) and any sightings of marine mammals around the piling vessel will also be recorded as per JNCC marine mammal recording forms and guidelines.

In the event of an observation within the MZ during the MMO pre-piling watch, the soft start will be delayed for 20 minutes after the last detection within the MZ to ensure any marine mammals have left the area.

It is expected that one dedicated and experienced MMO will be on watch, unless they do not have access to a location that provides a good all-round view of the mitigation zone (in which case multiple MMOs may be required).

MMO operations prior to any UXO activities will be largely similar as for piling; however, a 60-minute pre-clearance search will be maintained. Should any marine mammal be observed, they must be seen to exit the mitigation zone, or a minimum of twenty minutes must have passed since their last sighting before any detonation can progress. The pre-clearance search must be completed during good visibility conditions.

2.3 Passive Acoustic Monitoring (PAM)

A Passive Acoustic Monitoring System (PAMS) may be used to allow a trained PAMS operative to conduct acoustic monitoring. This may be utilised in conjunction with visual monitoring during daylight operations and/or as an alternative method of monitoring the mitigation zone during periods of reduced visibility. If a PAMS is not available for monitoring, then piling will be unable to commence during such periods of restricted visibility that are not conductive to visual monitoring as there is a greater risk of failing to detect the presence of marine mammals.

2.4 Acoustic Deterrent Device (ADD)

ADDs emit loud aversive sounds into the water to deter marine mammals from approaching, or encourage them to move away from, a potentially harmful location. Discussions will be held with the regulator to determine if an ADD is necessary, and if so, which type is most appropriate.

If deemed necessary, an ADD will be activated prior to piling or UXO activities. For piling, it will be active during the soft-start period, and for UXO prior to detonation – this may require the pre-clearance watch to be extended.

2.5 Soft-Start Procedure

Following the completion of the pre-piling search, a soft-start procedure will commence. This is where the piling hammer energy will gradually increase over a period of 30 minutes so that if any marine mammals are still present in the vicinity of the piling location, they are encouraged to leave by the initial low levels of underwater noise prior to the noise reaching levels which could cause PTS-onset. The MMO will continue to note detections and observations on animal behaviour during the soft-start period.

If a marine mammal enters the MZ during the soft start then the piling operation should either stop (if technically feasible), or the hammer energy should not be further increased until the marine mammal exits the MZ, and there is no further detection for 20 minutes. Once the soft start has been completed, there is no requirement to stop piling or reduce the hammer energy if a marine mammal is detected in the MZ.

2.6 Breaks in Piling

Breaks in the piling process could provide the potential for marine mammals to re-enter the mitigation zone. The guidance provided in JNCC states that "*If there is a pause in the piling operations for a period of greater than 10 minutes, then the pre-piling search and soft-start procedure should be repeated before piling recommences*".

2.7 Entanglement Risk

The Applicant is committed to addressing entanglement risk and will monitor for, and remove, marine debris caught on cables as part of the regular surveys of subsea infrastructure.

Design and frequency of this monitoring will be agreed with the Regulator and SNCBs post-consent once final design parameters – particularly number of turbines and number of mooring lines – are confirmed. Use of strain gauges will be considered as a possible monitoring option.

3. COMMUNICATIONS

This communications protocol will include, but not be limited to:

- Procedure to notify the MMO and/or PAMS operative to begin the 30-minute pre-piling search prior to soft-start commencing;
- Procedure for the MMO and/or PAMS operative to notify the installation manager that soft start can commence;
- Procedure for the MMO and/or PAMS operative to notify installation manager that a marine mammal has been detected in the MZ; and
- Procedure to notify MMO and/or PAMS operative that the piling operations have been successfully completed.

4. REPORTING

A record of all piling operations, marine mammal observations and PAM detections will be maintained.:

- Outline of the marine mammal monitoring methodology and procedures employed;
- Record of piling operations detailing date, soft-start duration, piling duration, hammer energy during soft-start and piling and any operational issues for each pile;
- Record of UXO operations, if applicable;
- Record of ADD start and stop times, if applicable;
- Record of marine mammal observations and PAM detections including duration of the pre-piling watch, environmental conditions during the pre-piling search, description of any marine mammal sightings and any mitigating actions taken, and a record of any incidental sightings made during the pre-piling search.
- Details of any problems encountered during the piling process including instances of noncompliance with the agreed piling protocol; and

- Reports will be collated and provided to NRW and JNCC on a weekly basis. In addition, a final report will be provided which will be submitted to NRW and JNCC. The final report will include any data collected during piling operations, details of MMO watch periods and observations, a detailed description of any technical problems encountered and what, if any, actions were taken. The report will also discuss the protocols followed and put forward recommendations based on project experience that could benefit future construction projects.
- In addition following installation, the Llŷr project will continue to perform cable monitoring and any instances of marine debris caught on cables will be reported under the arrangements agreed with the Regulator and SNCBs.